Resource conceptualization: The role of group dynamics in defining a firm's strategic resources

ABSTRACT

This study extends the Dynamic Resource-based view, which suggests managerial processes as a source of resource heterogeneity between firms, to analyze the role that group dynamic processes may have in the identification of strategic resources. The paper contends that resource heterogeneity is not only determined by substantive characteristics of a management team, but also by the very process of the group decision process. Two different groups' resource conceptualization processes were analyzed in search for the relationship between resource conceptualization process and the conceptualized set of resources. Contrasting group processes indicated differences in various group dynamic variables; deliberateness, cognitive overload, and cognitive and affective conflicts during the process of identifying strategic resources. The distinct group dynamics, in turn, determined diverse levels of understanding of the contribution of strategic resources to firm performance.

Keywords:

Resource-based view; Group decision; Strategy process

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INTRODUCTION

The Resource-based view (RBV) of the firm defines firms as bundles of resources, which have to be valuable, rare and non-imitable to provide firms with superior performance (Barney, 1991; Wernerfelt, 1984). However, mainstream RBV does not explain the process of realizing and acquiring valuable resources (Kraaijenbrink, Spender, & Groen, 2010). Detailed analysis of managerial process related to resource development can help to explain the origin of resource heterogeneity between firms (Kraaijenbrink et al., 2010; Maritan & Peteraf, 2011) but it still remains largely unexplored (for an exception, see Kunc & Morecroft, 2010).

In this paper, we expand the dynamic RBV perspective (Foss & Ishikawa, 2007; Kunc & Morecroft; 2010; Martian & Peteraf, 2011) by analyzing group-based resource conceptualization processes occurring in strategic planning activities. More specifically, our objective is to explore how group decision processes affect the conceptualization of the set of valuable resources of a firm. We conducted a behavioral experiment (Gist, Hopper, & Daniels, 1998) where we compared the group dynamics of two groups of experienced managers who were given the task of conceptualizing the set of resources for two different firms. We analyzed the data both qualitatively and quantitatively to reach satisfactory theoretical saturation (Eisenhardt, 1989a).

The paper is organized as follows. The first section provides a theoretical discussion regarding the dynamic RBV and the role of group processes in identifying resources. The second section explains the overall research methodology and presents two analyses employed for the case study. Based on these analyses, the overall findings of the case study, along with the theoretical framework are presented. The final section discusses the limitations and contributions of the study.

THEORETICAL BACKGROUDND

Following the cognitive perspective of strategic management research (Hodgkinson & Healey, 2008; Porac, Thomas, & Baden-Fuller, 1989; Walsh, 1995), we take the stance that the development of strategic resources, whether that be an identification (Barney, 1986), or an accumulation (Dierickx & Cool, 1989), are spawned from managerial strategic decisions (Maritan & Peteraf, 2011).

The cognitive perspective contends that strategic cognitions serve as a basis for strategic decision making (Hodgkinson & Healey, 2008). Strategic cognition comprises understanding firm's capabilities and resources. Past strategic cognition research has made empirical and theoretical advancements in strategic issue diagnosis (Dutton & Jackson, 1987; Jackson & Dutton, 1988). However, there is not empirical research to analyze the impact of strategic cognition on resource development.

Research into the managerial process during resource building can help explaining the resource heterogeneity between firms (Alvarez & Busenitz, 2001; Foss & Ishikawa, 2007; Kunc & Morecroft, 2010) for a number of reasons. First, the environment that managers are facing is uncertain and complex (Amit & Schoemaker, 1993), and there are often delays on the effect of managerial decisions (Adner & Helfat, 2003). Thus, the relationship between managers' decisions and the decision outcomes remain causally ambiguous (Lippman & Rumelt, 1982; Powell, Lovallo, & Caringal, 2006). Second. faced with such a complex environment, managers with limited cognitive abilities engage in simplifying heuristics generating blind spots (Zajac & Bazerman, 1991) and cognitive biases (Barnes & James, 1984; Das & Bing-Sheng, 1999; Schwenk, 1984; Schwenk, 1986). Third, managers attend selectively to a small number of competitors (Clark & Montgomery, 1999; Porac & Thomas, 1994), and competitor dimensions (Hodgkinson, 1997; Walton, 1986). Fourth, these simplifying mental models tend to persist in the face of shifting competitive dynamics, being a primary source of strategic persistence and inertia (Barr, Stimpert, & Huff, 1992; Reger &

Palmer, 1996). Fifth, using their mental models, managers perceive and interpret particular information differently and have different strategic insights even in situations when similar analytical frameworks are used (Gavetti & Levinthal, 2004). Therefore, the origin of resource heterogeneity between firms arose from differences in resource conceptualization processes.

Resource conceptualization process

If the process of resource conceptualization is attributed as a domain of an individual, such as a CEO, it may possess only a limited explanatory power towards firm heterogeneity, as the CEO is not the only actor engaged in strategy development (Hambrick, Cannella, & Pettigrew, 2001). With various stakeholders in a firm, strategies are ultimately the product of a negotiated order (Walsh & Fahey, 1986), in which the conflicting cognitions of diverse stakeholders must somehow be reconciled (Forbes & Milliken, 1999; Pettigrew, 1973, 1985). Therefore, rather than seeing resource conceptualization as a product of a rational or lucky manager (Barney, 1986), we analyze resource conceptualization as a process occurring within group of managers.

The role of group decision making process during resource conceptualization

One fundamental challenge that exists with the study of top management team is that managers within the same organization are likely to have different mental models as they have heterogeneous experiences (Kunc & Morecroft, 2010; Pitcher & Smith, 2001). If a group's characteristic is only measured in terms of substantive cognition, having diverse mental models co-existing within a firm at the same time will imply multi-dimensional insights towards its competitive environment (Boone & Hendriks, 2009; Cannella, Park, & Lee, 2008). Accordingly, managers with different insights and skills may help the firm to recognize and acquire valuable resources earlier than its competitors, thus leading to the creation of economic rent (Makadok, 2001).

Simply having different mental models within a firm does not guarantee an effective strategic decision since a group mental model is not a simple summation of individual mental models (Mohammed, Ferzandi, & Hamilton, 2010). Rather, there is a complex process of interactions between mental models to reach the firm level mental model (Foss, 1997; Lawrence, 1997; Pelled, 1996). Such a process may involve conflicts (Amason, 1996; Pelled, Eisenhardt, & Xin, 1999), information exchange (Boone & Hendriks, 2009), politics (Eisenhardt & Bourgeois, 1988), advice seeking (McDonald & Westphal, 2003), and the comprehensive assessment of options (Forbes, 2007; Simons, Pelled, & Smith, 1999). In other words, a particular decision of a firm is an outcome of a negotiated order (Walsh & Fahey, 1986) or an interaction process between heterogeneous mental models. Just as substantive mental models differ between managers, so too group decision making processes varies from group to group determining differences in group outcome effectiveness (Knight et al., 1999; Pelled, 1996) in terms of resource conceptualization.

Although there is a number of theoretical papers (Foss & Ishikawa, 2007; Helfat & Peteraf, 2003) that attribute substantive mental models as an explanatory factor of resource heterogeneity between firms, there is a lack of empirical studies that specifically investigate the role of a group decision process in the process of conceptualizing strategic resources. Our study intends to answer the following question.

How do group processes lead to the conceptualization of the set of strategic resources responsible for firm performance?

To investigate the above question, we referred to the group process dynamics literature.

Group process dynamic

Group decision process has been theorized and tested from various angles in the strategic management literature (Hodgkinson & Starbuck, 2008; Jarzabkowski, Balogun, &

Seidl, 2007). We identified four theoretical concepts that are relevant for the analysis of group processes of resource conceptualization: deliberateness may refer to the level of analysis employed in the resource conceptualization process, overload indicates the level of stress generated by the amount of information processed to identify resources, and intra-group conflict captures the impact of conflicts on the selection of those resources deemed strategic.

Deliberateness. Strategy process research has a long tradition of theoretical debates regarding the level of rationality involved in the strategy development process (Das & Bing-Sheng, 1999). Among many contesting views, Mintzberg and Waters (1985) provide a clear distinction between rationally designed (deliberate approach) and natural and flexible (emergent) approaches. Deliberate strategy scholars suggest the strategy process as a set of rationally intended behaviors of managers (Andrews, 1987; Ansoff, 1987; Goold, 1992). In order for a strategy to be completely deliberate, it must have a detailed plan, shared intentions, and have an outcome as expected (Mintzberg & Waters, 1985). Emergent strategy process, on the other hand, does not rely on the analytical nature of strategy process. Rather, it emphasizes a spontaneous flexibility or social interaction process such as politics (De Wit & Meyer, 2004; Eisenhardt & Bourgeois, 1988). This emergent process is often compared to the process of a weed growing out in a garden (Mintzberg & McHugh, 1985), i.e. an idea which spawned from a disordered series of ideas. Mintzberg and Waters (1985) state that every strategy process inevitably has partial characteristic of both deliberate and emergent strategy; yet it may elucidate more characteristic towards one of the two. Thus, deliberateness corresponds to a systematic process of discussion within a group of managers leading to a certain set of resources to be employed in a strategy.

Overload. Some scholars define organizations as information processors (Tushman & Nadler, 1978). One of the roles of an organization, as an information processor, is to store, process and retrieve information (Walsh & Ungson, 1991). With this view, an organization's

ability to process key information is an important attribute of a firm. However, due to limited cognition and unmanageable inflow of information (Simon, 1991), the required amount of information often exceeds organizational actors' processing capacity; thus causing 'overload' of information (Speier, Valacich, & Vessey, 1999). The role of overload has been studied and tested against various fields such as budget decision (Swain & Haka, 2000), organizational decision quality (Speier et al., 1999) and cognitive ability (Fayol, Largy, & Lemaire, 1994; Kirsh, 2000) and it has been agreed that overload is detrimental to decision quality. Thus, group of managers may be overloaded with too much information regarding the right set of resources to develop, such as characteristics (e.g. value, rareness) or linkages between them (Kunc and Morecroft, 2010).

Intra-group conflicts. Conflict has been extensively examined in the group process literature. The construct is a common component of group processes that has a strong influence towards the strategic decision outcome; yet the effect of conflict has been paradoxically identified as positive and negative (Cray, Mallory, Butler, Hickson, & Wilson, 1991; Janis, 1982; Schweiger, Sandberg, & Ragan, 1986). A group of researchers disentangled the paradox by categorizing the conflict into two categories; one being a functional task-related conflict (cognitive conflict), and the other being the dysfunctional emotion-related conflict (affective conflict) (Jehn, 1995; Mooney, Holahan, & Amason, 2007; Pelled et al., 1999). Task-related conflicts stimulate the discussion between the decision makers, leading the group to be able to evaluate the issue from various angles; whereas emotional conflict hinders a fluent discussion between the group members (Amason, 1996). Although the above distinction has been tested and supported, it has also been found that cognitive conflicts can be developed into affective conflicts, as the heated discussion during cognitive conflicts can lead into emotional clashes (Jehn, 1997). Hence, under the norm of intra-group conflict, the key for an effective group decision is to encourage cognitive conflict while keeping the affective

conflict at minimal level. Many resources are difficult to identify due to their characteristics (tangible vs. intangible) and impact on performance (causal ambiguity) that may transform a cognitive conflict into an affective conflict if the discussion between a group of managers is not properly conducted.

Using the above four group dynamic constructs as a primary reference, we conducted an exploratory study using two groups that were engaged in a group resource conceptualization process.

RESEARCH METHODOLOGY

For method, we conducted observational study (Henderson, Trope, & Carnevale, 2006; Weingart, Brett, Olekalns, & Smith, 2007) with an aim of uncovering the role of group dynamics within resource conceptualization processes. The core objective of the study is to unfold the dynamics of resource conceptualization processes using the group dynamic constructs: deliberateness, overload, intra-group conflicts, and decision comprehensiveness. Our methodology follows three steps. First, we required two groups to conceptualize the resources of two firms while we observed their group dynamic processes. Second, we contrasted the two groups dynamic processes quantitatively using the constructs mentioned previously. Third, using the findings from the quantitative analysis, we analyzed the two groups' heterogeneous processes in depth using qualitative analysis in order to identify the origin and development of the groups' differences. The research uses mixed method approach (Creswell, 2003); the mixed method approach is a complementary one ensuring both objectivity and richness of the analysis (Eisenhardt, 1989a; Jehn, 1997; Yin, 2009).

For our observational study, we anticipated that a close examination of managerial interaction behavior would provide rich detail of a managerial decision process. For this reason, we conducted an observational study using behavioral simulations (Gist et al., 1998; Hodgkinson, Bown, Maule, Glaister, & Pearman, 1999; Hough & White, 2003).

The simulation was performed with two groups of experienced managers with an average age of 35. The participants were recruited from a part-time MBA program at a university-based business school. Each group consisted of seven members from diverse cultural background. The overall task of the two groups was to develop a strategy for their given firms. Group A was in charge of developing a strategy for a *low-cost airline company*, whereas Group B developed a strategy for a *computer devices manufacturing firm*.

Behavioral simulation constructs an artificial environment which can reflect managers' decision making processes. This approach allows a close examination at specific decision levels. This gives an advantage compared to firm level analysis which often has to make the assumption that the firm goes through similar decision processes for every decision (Hough & White, 2003). Furthermore it gives researchers the option of directly observing the process of decision making. We observed the process without intervening using video recording. Analysis is divided into two parts. The first part compares the quantitative difference between the two teams, the difference is preliminarily accepted, and serves as a reference in the qualitative analysis. The second part seeks the drivers of such difference between the two teams. For qualitative analysis, we followed the group discussion through the transcripts and videos and validated the propositions by looking for appropriate quotations. This was to ensure that the impressions were thoroughly grounded with empirical evidence (Eisenhardt, 1989a).

Task - Resource conceptualization process

Since mental models are qualitative in their nature (Rouse & Morris, 1985) and difficult to retrieve, we chose to view the managers' resource conceptualization as a map (Eden, 2004; Hodgkinson et al., 1999; Huff, 1990; Kunc & Morecroft, 2009; Reger & Palmer, 1996). Among several mapping technique, we chose resource mapping as a technique to capture the resource conceptualization process.

Resource mapping (Kunc & Morecroft, 2009) considers the performance of firms as being driven by asset stock accumulation processes (Dierickx & Cool, 1989) . The technique views a firm as a system of complexly intertwined resources determining the firm's performance over time (Kunc & Morecroft, 2009; Morecroft, Sanchez, & Heene, 2002). A standard resource map has stocks and flows (Sterman, 2000), which represent the resources and their accumulation rates (Dierickx & Cool, 1989) respectively. Such a representation is used to map the management perspective about the resources that can be purposefully adjusted (Dierickx & Cool, 1989). Another aspect of resource mapping is that it shows the linkages between resources themselves and external/critical success factors leading to a representation of the firm as a resource system (Miller & Shamsie, 1996; Morecroft et al., 2002); comprised by complex interrelationship between the resources.

Procedure

The experiment took place as a part of strategy development project for their assigned firms. The participants were given prior knowledge of various strategy development tools (O'Brien & Dyson, 2007) such as visioning, SWOT analysis and scenario planning. Instructions on resource mapping were also given. The participants were engaged in a resource mapping process in order to make sense of the competitive environment as well as the firm's resource system to support their strategic development process. The groups were asked to develop the resource map for their firm within a timeline of one hour.

ANALYSIS

Step 1 - Quantitative comparison between groups

The analysis was conducted using both quantitative and qualitative data sources. Use of quantitative measures are often used along with qualitative analysis as it improves the

objectivity of the study and protect the researchers from being overwhelmed by the deceiving qualitative data (Jehn, 1997; Yin, 2009).

Quantitative data was collected from three sources: resource map, a survey to group members, and independent coders. The resource map was used to compare the two groups' mental model complexity. From group members, we collected satisfaction scores regarding the group process. Lastly, we used independent, third party, coders to measure various group dynamic process constructs. Based on the quantitative data, we conducted a preliminary comparison between the two groups; the comparison provided an insight into the aspects of the group process that were different between the two groups. This gave us a more refined focus for the qualitative analysis. We conducted a quantitative analysis to have preliminary insights towards the two groups' discrepancies. The following describes each of the measures used:

Strategic cognitive complexity

Strategic cognitive complexity refers to a level of cognitive ability to use complex and multiple constructs when perceiving phenomena (Bieri, 1955; Hitt & Tyler, 1991; Wally & Baum, 1994). A high level of cognitive, or mental model, complexity enables a decision maker to use multiple constructs or perspectives to assess information, leading to a broader set of evaluation criteria during the decision making process. Having a complex mental model is found to assist a decision maker to make sense of the complex competitive environment; hence positively affecting the competitive success (McNamara, Luce, & Tompson, 2002). Following the above notion, we adopted resource map complexity as a tentative measure for group resource conceptualization effectiveness. Following Gary and Wood's (2011) measure of mental model complexity; we measured the number of inferred causal linkages between the constructs within the resource map. Since the two groups industries were different, we were aware that this complexity score could not serve as a definite measure of group effectiveness; we thus used the complexity score as a reference before conducting the qualitative analysis.

Satisfaction

We also used group members' perceived satisfaction towards their group process as another measure of preliminary group outcome. Intra-group conflicts were found have a negative relationship with group members' satisfaction, where affective conflict particularly exhibits a stronger negative relationship with the satisfaction (Jehn, 1995; Jehn & Mannix, 2001). Although past research indicates that group effectiveness and group satisfaction do not have any significant relationship (Schweiger et al., 1986; Schwenk & Cosier, 1980), group satisfaction has been used as an important construct to measure group viability (Amason, 1996; Jehn, 1995; Jehn, Greer, Levine, & Szulanski, 2008). We employed intra-group conflict research methodology (Jehn, 1995); three seven point Likert-scale questions were asked directly to the participants after their resource conceptualization process.

Deliberateness of the group process

Following Mintzberg and Waters' (Mintzberg & Waters, 1985)'s distinction on strategy process, we measured the extent of deliberateness of the groups' resource conceptualization process. We were unable to find a previous study that specifically measured the level of deliberateness quantitatively. Based on the review of strategy process literature (De Wit & Meyer, 2004; Goold, 1992; Mintzberg, Pascale, Goold, & Rumelt, 1996; Mintzberg & Waters, 1985), we identified three factors that could be used to determine the level of deliberateness in a process: level of structure, analytical nature and level of formality of the process. We created three seven point Likert-scale questions asking the above three dimensions and asked the third party coders to rate their perceptions.

Overload

We reviewed literature that discusses the concept of overload and conditions that may trigger such overload. We followed definition of overload as a situation where demand

for cognitive process exceeds the cognitive process capacity (Speier et al., 1999), and found three conditions that can cause overload to managerial cognition: information over-supply; high demand for information; high need for multi-tasks (Edmunds & Morris, 2000; Eppler & Mengis, 2004; Kirsh, 2000; O'Reilly, 1980) that were the base for three seven point Likert-scale questions. We presented the questions to the independent coders.

Intra-group conflicts

We examined previous data analysis methodologies for cognitive and affective conflicts. There were two categories of data that researchers had examined. The first category of data captured the general atmosphere of the team (e.g. amount of conflict under normal occasion) (Jehn, 1997; Knight et al., 1999). The second category of data captured conflicts during a decision making or a project (e.g. conflict under the most recent decision making or a 10 weeks project) (Amason & Sapienza, 1997; Jehn et al., 2008; Mooney et al., 2007). Our data fitted into the second category. Based on the literature on intra-group conflicts, we found that questions mostly originates from Jehn's (1994) conflict measures (Amason & Sapienza, 1997; Jehn, 1997; Jehn et al., 2008; Mooney et al., 2007). Following this stream of the literature, we created three seven point Likert-scale questions for each conflict type, based on Jehn's (1994) questions.

We compared the differences of the two teams using the previously defined measures. In order to maximize the reliability of our analysis, we showed the videos of the two group's discussions to coders who were blind to the hypotheses under investigation (Jehn et al., 2008). The coders were asked to complete a questionnaire containing questions designed to measure the group's group dynamics variables. Following Shah and Jehn's (1993), we briefed the coders about the theoretical concepts prior to showing the videos. Afterwards, we asked them to complete the questionnaire, and then averaged their ratings across each question, which are presented in Table 1.

Insert Table 1 about here

Table 1 shows scores of seven quantitative items and Cronbach's alphas where applicable. We were aware that the quantitative findings could be vulnerable to two types of variability: inter-questions and inter-coders. To confirm that the collected data was reliable from both types of variability, we computed Cronbach's alpha and intraclass correlation. As can be seen, for all five constructs the α scores were above 0.75, which meant that the questions exhibited internal consistency (Knight et al., 1999; Mooney et al., 2007). Furthermore, we tested two-tailed intra-class correlation (Shrout & Fleiss, 1979) to see if the coders perceived the questions in a similar manner. The intra-class correlation value was 0.927; this showed a satisfactory level of conformities among the coders. Based on this agreement level, we concluded that the both the questions' internal consistency and inter-coder consistency were acceptable (Jehn et al., 2008).

It is noticeable that each group received substantially different scores for most of the criteria. Group A showed a more deliberate form of resource conceptualization, certainly less overload and affective conflict compared to Group B. Although there is a difference of 0.8 for the cognitive conflict construct, it is debatable whether coders thought that Group A exhibited more cognitive conflict compared to Group B since the difference is not large. Therefore, we decided not to develop any preliminary assumption towards the level of cognitive conflicts the groups experienced. For other constructs, we accepted the differences and chose to use them as a basis of the qualitative analysis.

Step 2 - Qualitative analysis of groups dynamic processes

The purpose of the qualitative analysis was to gain more in depth insights behind the exposed differences that were found in the quantitative analysis. In other words, the qualitative analysis was conducted to analyze the causal mechanisms that led to the differences between the two groups' processes. We employed iterative methods (Eisenhardt,

1989a) for the qualitative analysis. That is, we narrowed the analytical lens as the analysis progressed. Starting from the constructs of focus and preliminary propositions developed from the quantitative analysis, we compared the two groups; the focus became narrower and more refined as the analysis progressed. The iterative analysis was made until a satisfactory theoretical saturation was reached.

For the qualitative analysis, we used video recorded group discussions during the resource map building, along with the transcripts of the discussions. We then observed the videos while going through the transcripts. Use of transcriptions is a common practice in decision process research (McComb, Kennedy, Perryman, Warner, & Letsky, 2010; Shah & Jehn, 1993; Weingart et al., 2007), as it provides vivid discussions which researchers can easily refer to. Furthermore, the use of video recordings enables more robust analysis, as it gives more understanding of the mood of the speakers by their tone and facial expressions (Haw & Hadfield, 2011).

Overall, we generally supported the quantitative findings. The two groups' resource conceptualization processes are described in a chronological order along with appropriate quotations to support the findings. We divided the process into a number of phases; the phases were distinguished when the nature of the task changed or a major breakdown occurred.

Group A: Incremental and causal linkage oriented resource conceptualization process

Group A, consisting of seven managers, conceptualized the resource system of a low cost airline company in a time limit of one hour. The group gained higher score than Group B in satisfaction, complexity and deliberateness. We retained an unbiased perspective towards the discrepancy of the cognitive conflicts between the two groups. They gained a lower score in affective conflicts and overload. If the quantitative findings hold, Group A was engaged in a well-organized rational group process in relation to Group B. We analyzed the group's discussion to find whether the quantitative findings could be supported and also to identify the drivers for the findings.

We divided the group's conceptualization into four major phases. Figure 1 shows the changes in number of resources and factors, along with the list of resources (in bold font) and factors at the end of each phase. The group finished their resource conceptualization in the first two phases and spent the next two phases on improving the resource map.

Insert Figure 1 about here

The first impression that arose from observing group A's resource conceptualization was the orderly fashion of the process. Members did not interrupt while other members were speaking, nor did they bring in another topic of discussion unless the discussion of the current topic was finished. Although it was only an impression at this stage, it seemed that this orderly process helped the group to maintain a comprehensive process. We further observed the discussion and found a distinctive characteristic of the group; the group was conceptualizing the resources based on the causal linkages between them.

Phase 1. The group started with 'planes' as the first important resource, and then developed the resource map based on the causal linkages from it. The group agreed that an increased number of planes led to an increase in routes, which in turn increased the number of staff. As can be seen from the following quotation, it was evident that the group paid equal amount of attention to both resource conceptualization and the linkages between resources.

Male A1: "Well I guess you'd start... I would start by planes."
Male A1: "Planes. We should have capacity somewhere."
Male A4: "But that means if you have more number of planes, then more capacity."
Male A1: "Yeah."
Male A2: "We can have more planes, more routes."
Male A4: "We have got more routes…then.."
Male A1: "We can have staff also."
Male A1: "But staff also fall into ... More capacity into staff."

There were a number of occasions when group members had different opinions regarding the firm's resources and factors and their causal relationships. This disagreement sometimes led to heated discussions between the group members. It was clear that the Group A experienced

a certain level of cognitive conflicts. However, even though cognitive conflicts were clearly present, group members did not intervene while others were speaking. Moreover, the members did not move onto a new topic until the debate regarding the current topic was over. Due to this systematic discussion process, group members were able to exchange their opinions more freely and could successfully conceal the differences of their opinions without being disturbed. Considering that cognitive conflicts can be developed into affective conflicts (Mooney et al., 2007), the group managed its conflict well and reached closure before it could be potentially developed into affective conflicts. The following quotation illustrates how the group systematically moved from one discussion to another.

> *Female A1: "I think you also need to have... Have you finished with that bit of discussion? Because you also need to link sales, sales to somewhere passenger numbers and marketing."*

The fact that the group members all agreed upon the topic of discussion before they moved onto another topic helped the group members to maintain the resources or causal relationships they were building throughout the group work. This was evident as all 16 concepts that were discussed during the task were all incorporated into the final resource map. The systematic resource identification process resembled the structured and formal nature of deliberate strategy process.

Phase 2. Once the group conceptualized all the resources, the group revisited the resource map to further understand the causal relationships between resources and factors. Since the group conceptualized the resources based on causal linkages, major linkages were already incorporated into the resource map. The group confirmed the existing causal linkages between resources and factors, and then searched for further potential linkages between them. Through this process, the resources that were loosely related with each other through major causal linkages were tightened with extra linkages via intervening concepts. Furthermore, the group was able to firmly build a mutual understanding of the resource map of their

organization. In other words, the individual mental models of group members were successfully merged into a group mental model.

When the group verified all the linkages, they confirmed that their resource conceptualization process had ended. However, because they finished the conceptualization process in a relatively short time, the group was able to substantiate their resource map with their business strategy by going through two additional processes.

Phase 3. The group aligned their conceptualized resources with the firm's vision; becoming Europe's best value airline. The group shifted their vision from world's best to Europe's best, and discussed whether the vision was appropriate. They then further discussed how improving resources would relate to their value proposition (e.g. No. of passengers and value proposition). This process allowed the group to bind tight relationships between their corporate level strategy, which often is noted as a high level strategy, and the resources of their firm. Stated differently, the group was able to develop a better understanding between the key resources and the firm's vision.

Phase 4. Once the group aligned their vision with the resource map, the group followed the causal linkages of the resource map, and discussed a potential scenario involving the increase and then the decrease of one resource or factor at a time (e.g. low vs. high state of economy). A number of scenarios were created based on these increase/decrease scenarios. This scenario planning aspect (O'Brien & Dyson, 2007) of their process helped the group to improve the robustness of the resource map. Furthermore, via this process, the group attempted to make sense of the firm's resource accumulation process in regard to a change in one external factor, which provided insights towards the resource management perspective. Considering that the group utilized two other strategy support tools, we concluded that the group took a comprehensive approach to their decision making as they have used multiple criteria to develop their decision.

After all processes, the group was satisfied with their resource map and concluded their resource map conceptualization. Figure 2 shows the final resource map of the group.

Insert Figure 2 about here

Group B: Divergent, resource oriented process

Group B conceptualized the resource system of a computing devices manufacturing firm. The group's satisfaction score was 3.9/7 and they inferred 17 linkages across 14 resources and factors. Unlike Group A, Group B spent the entire time conceptualizing individual resources. We divided the process into five phases. Figure 3 shows the changes in number of resources and factors chronologically, and resources and factors at the end of each phase.

Insert Figure 3 about here

As can be seen from Figure 3, Group B's resource conceptualization process was much more complex than the first group. Group B experienced three major breakdowns during resource conceptualization, which forced them to abandon the majority of resources/factors and causal linkages. We thoroughly examined the video of the group process to understand the reasons behind such breakdowns, and we found that the group dynamics of Group B were notably different to those of Group A.

Phase 1. First of all, Group B conceptualized resources without considering potential linkages between them. Ignoring the linkages, Group B members listed concepts without any restriction. Any resource/factor that a member mentioned was added directly onto the whiteboard where they were drawing their resource map. This process was somewhat similar to a brainstorming process, as members did not interrupt this process unless they had to

clarify the definition of a resource/factor. A typical resource map building conversation for the group is shown below.

Male B1: "So what resources are relevant to a company then?"
Male B1: "Staff?"
Male B6: "Cash"
Female B1: "Yeah, everybody needs cash."
Male B3: "Product?"
Male B6: "Customer.."
Female B1: "Premises?"
Male B1: "Equipment?"

Phase 2. A problem arose as soon as they started to link the resources and factors. Group members had different ideas about how resources/factors should be linked. Clearly, linking them was not a simple task; the problems seemed to be caused by two issues. Firstly, the relationships between resources were not one-to-one. One resource could affect various resources and trying to understand these non-linear relationships of multiple resources/factors required group members to process too much information. Secondly, the 'resources-performance' relationship could not be directly linked (Kaplan & Norton, 1996). In other words, although some resources definitely were inter-related, it was not possible to link those resources unless a mediating resource or factor was added. The following quotation describes a situation where the group faced difficulties in terms of understanding both the non-linear relationships of factors and the resource system.

Male B2: "Sales... Sales staffs generate cash flow."
Female B1: "Well they generate... They take cash flow away, but they create sales so they're creating cash."
Female B1: "But a negative isn't it? Because it's a cost."
Male B2: "But the sales team sells through the stores and they—"
Male B5: "Generate more revenue and at the same time if you increase their sales through number you bleed from wages so..."
Female B1: "Hmm…"

As the group tried to find interrelationships, a series of heated discussions were triggered because they had all different ideas about the interlinking concepts. However, unlike Group A, the discussions failed to develop systematically as they were often interrupted by other topics.

Such interruptions were caused by the multiple tasks facing the group. The group was actually doing two tasks simultaneously: identifying causal relationships between existing factors; and, creating new mediating factors. Furthermore, since the concepts were already created, there was always more than one issue that arose at the same time. For example, one group member was trying to clarify the marketing concept, while another group member was trying to articulate the causal link between R&D and cash flow. This anarchic group process not only had adverse effects on the group's ability to pursue rational debates, but it also created emotional tensions between the members who became unsatisfied with the communication failure within the group. In other words, the group failed to develop effective cognitive conflicts, and unintentionally, developed affective conflicts. Group members realized that the resource map was getting out of hand, so they decided to abandon their current resource map.

> *Female B1: "I think we are going through error of doing this; building the whole thing at the same time… It's supposed to build a bit at a time, so you put two things in a link in the way they need to be, then another one linking from it. You go one at a time, one relationship at a time because that's how you build a whole block."*

Phase 3. After the group agreed to change their approach, they decided to split the tasks into more manageable chunks, linking the pieces together afterwards. The tasks were divided into key themes: marketing, production, R&D, and supply chain. Two to three group members joined to discuss the themes that they were in charge of. There was no communication between the sub-groups during this phase, which led the four sub-groups to develop rather independent resource maps of the business units.

Phase 4. The group attempted to link the four themes once they were all developed, yet a second breakdown occurred. As mentioned, the sub-groups did not communicate while they were building the resource maps for their themes. Having independent resource maps from one another, the group struggled to link the themes with the intervening concepts. They were forced to eliminate contradicting and duplicated resources and factors. They decided to

abandon their resource map for a second time. They restarted the map building with less than 15% of the time remaining. Pressed for time and suffering from difficulty in understanding the complex interrelationships between resources/factors, the group attempted to build the resource map as a single group; they built it as simple as possible.

Phase 5. After the generic resource conceptualization process, the group finalized the resource map. They merged two resources that they perceived to be duplicated and they also renamed resources in a more distinguishable way. The final resource map of the group was missing a number of well-developed firm-specific resources/factors that they had developed during earlier phases. As can be seen from the quotation below, group members seemed noticeably unsatisfied with their resultant resource map.

Female B1: "We made a quite generic map which can fit pretty much any company not only our firm. It's pretty much an ordinary company's map we have here, isn't it?"
Male B4: "I suppose so, but you know, I think we need to be more firm specific… or... I don't know, they are—"
Female B1: "You are going to now? [looks at watch]"
Male B3: "We do only have five minutes."
Female B1: "We could have done… I don't know…"
Male B1: "So this is our resource map…"
Male B2: "If I was the CEO, I would have said so what, you need to tell me why, what's good about it."

As Figure 3 suggests, there were numerous concepts discussed by Group B members. Some concepts were merged (e.g. product, service to product and service offers) and renamed (e.g. brand to reputation) but others disappeared due to the difficulties the group experienced during synthesizing. Out of nine resources and 23 factors, only four resources and 11 factors survived in the final resource map. As can be seen in Figure 4, Group B's resource map is much simpler compared to Group A's. Although the number of constructs does not guarantee the quality of the resource map, for Group B, it is clear that the final resource map did not reflect the full discussion of the group at all. It is worth noting that the group ran out of time when they were creating the map, which is not surprising as they restarted building the

resource map twice. The hectic resource conceptualization justified group B's high scores on Overload, as well as their low score on satisfaction, deliberateness.

Insert Figure 4 about here

DISCUSSION

After carefully going through the two groups' decision processes, we confirmed the quantitative scores and the discrepancies between the two groups. After the analysis, we identified three key differences the two groups experienced during their resource conceptualization process.

1. Group A appreciated the relationship between the resources and conceptualized the resources one by one in a causally oriented manner, whereas Group B conceptualized resources without any restriction and attempted to link the resources that had been generated; this led Group A to be engaged in a much more structured and orderly process of resource conceptualization compared to Group B.
2. Both Group A and Group B experienced disagreements between their members in the course of resource conceptualization, which sometimes led to cognitive conflicts between the members. However, Group A experienced a clearer form of cognitive conflict as the members did not interrupt nor introduce other topics during the discussion. Group B, on the other hand, often experienced disrupted discussions due to the continuous introduction of other topics. Moreover, this anarchic style of discussion triggered emotional tension between the members of Group B.
3. The orderly process adopted by Group A strictly restricted the members to discuss one strategic resource at a time; leading the group to enjoy a process free from breakdowns. In contrast, Group B experienced a number of breakdowns as they were not able to manage the excessive volume of information they were required to process.

We divided the discussion of the findings into three subsections; theoretical alignment and limitation of the study.

Theoretical alignment

We observed different decision processes during resource conceptualization processes. As can be seen from the above qualitative analysis, the two groups approached the resource conceptualization process differently. Group A appreciated that individual resources were highly interrelated and paid equal amount of attention to both resources and causal linkages; i.e. this group saw the firm's resources as *systemic resources (Miller & Shamsie, 1996)*. On the other hand, Group B saw resources as independent of one another, and listed strategically relevant resources without worrying about the interrelationships between them; in other words, this group saw the firm's resources as *discrete resources (Miller & Shamsie, 1996)*. Along with this identification of the heterogeneous approach to resource conceptualization, the qualitative analysis revealed that the two groups differed in their utilization of cognitive conflicts and the structure of the group process. We will now link the findings with the three group process constructs that we compared quantitatively.

Deliberateness of resource conceptualization

The systemic resources oriented group, Group A, experienced a more structured and formal process as the group followed a clear process defining relevant resources/factors one by one based on causal linkages between the resources/factors. Furthermore, using their resource map, they updated their vision as well as created a number of scenarios based on changes in external factors in the resource map. Using various analytical frameworks, the group was able to engage in a comprehensive resource conceptualization process. Hence, in this group, it can be argued that they followed a more systematic and analytical formation of strategy (Ansoff, 1987; Ketokivi & Castañer, 2004). For the discrete resources oriented group,

Group B, the process was rather unstructured; they proposed several resources without a clear idea of their usefulness or the underlying causal linkages between them, which led to continuous discussions and distractions ending in a rather general set of resources. For them, strategic resources come from creative ideas within a flexible and unbounded environment leading to a rather messy process (De Wit & Meyer, 2004). However, merging the resources and factors by causal linkages provided them a great challenge, and the group in the end experienced severe breakdowns in their resource conceptualization process. The group lacked an important attribute that was needed to handle a messy process; to manage and synthesize large amount of information (Eisenhardt, 1989b). The discrete resource oriented group failed to cope with this challenge, and thus ended with an unsatisfactory group decision outcome.

The systemic resources oriented group conceptualized their resources in a structured manner; they analyzed the resources and their relationships extensively with their members.. More importantly, their comprehensive process was well managed; hence, the group was able to maximize their effectiveness while not losing their efficiency.

The discrete resource oriented group, on the other hand, merely finished the resource conceptualization in a given time of one hour; they did not manage to synthesize the resource map with other analytical frameworks. The group's resource/factor identification stage was somewhat ambitious as their identification process followed a divergent pattern; they generated more resources and factors than the systemic resource oriented group.

Effect of causal ambiguity towards group cognitive overload

The two groups' different processes determined the level of overload of each group. The discrete resources oriented group, Group B, with its anarchic process, experienced a high level of overload during their resource conceptualization. They seemed to be struggling to handle various resources at the same time, overloading their capacity to process the complexity of a resource-based strategy. This is not surprising, considering that they had to deal with

several resources; this increased the supply and demand of information as well as the need for multi-tasking. Furthermore, the group did not agree in which order they would investigate the resources and causal linkages. This caused additional burdens to their cognition and more confusion within the group. The first group, Group A did not have these problems, as the group followed a well-structured group process.

Role of intra-group conflicts in resource conceptualization

Cognitive conflicts were evident in both the systemic resources oriented group and the factor oriented group. Cognitive conflict is a vital component in a resource conceptualization process. Since individual managers have different insights towards their firm's resource system (King & Zeithaml, 2001; Kunc & Morecroft, 2010; Walsh, 1995), it is natural for managers to disagree to each other and to experience conflict. However, such clashes between insights may harm the overall efficiency of the group process (Milliken & Martins, 1996). The systemic resources oriented group, with its highly structured conceptualization process, did not have to sacrifice their efficiency. Furthermore, they were able to maximize the effectiveness of cognitive conflicts, as the group was able to focus on the topic of discussion during episodes of cognitive conflict; this helped the group to build a solid understanding of the resource system of the firm.

The discrete resources oriented group, on the other hand, had unclear and discontinuous episodes of cognitive conflicts; caused by an anarchic group process with a high level of interruptions from other topics. As a result of this process, the group members were not able to take a full advantage of the cognitive conflicts as most of conflicts did not reach agreement. Not being able to reach agreements under time pressure, the group members were forced to incorporate only the most obvious resources and factors that all group members agreed upon; thus the resource map had to be as generic as possible.

Affective conflict was arguably more evident in the discrete resources oriented group as the group had more tension between members, possibly triggered by unproductive cognitive conflicts, along with stress and frustration that was caused by lack of time and wasted effort. Affective conflicts hindered the resource conceptualization process with unnecessary emotional tension. Furthermore, this left a potential threat to any subsequent group processes as the emotional tension may have caused further affective conflicts in different contexts (Jehn, 1997) and increasing communication barriers among the members of the team.

Table 2 summarizes the differences in the group dynamic constructs based on the theories that we have selected.

Insert Table 2 about here

This study allowed us to look into a complex dynamics hidden under group resource conceptualization processes. The limited number of cases restricts us to present strong theoretical propositions. *However, we reached a conclusion from the study that the adopted style of process, systemic vs. discrete resource oriented, can affect the level of structure during a group's resource conceptualization process*. We expect a group enjoying effective cognitive conflicts with low level of overload and affective conflicts is capable of conceptualizing a systemically, firm specific, idiosyncratic set of resources. On the other hand, a group that experiences a resource conceptualization process focused on discrete resources is more likely to conceptualize a resource set with loose linkages between the resources.

Limitations

Use of experimental design

Using MBA students in an experimental setting instead of managers discussing a real strategic problem in their own firms is susceptible to criticism. However, we aimed to observe the impact of group dynamics on the process of conceptualization of a set of

resources rather than a critical evaluation of its content in terms of VRIN dimensions (Barney, 1995).

Potential effects from other variables

In this research, there were two major differences between the groups. From the study, we believe, ceteris paribus, a group's orientation towards resource conceptualization affects the group process dynamics as has been discussed. However, countless variables affect a group's process and outcome (Finkelstein, Hambrick, & Cannella, 2009). Firstly, the groups were likely to have heterogeneous substantive group characteristics (e.g. cognitive ability), and we accept that the group process may have been affected by heterogeneity in them. Secondly, the two groups conceptualized resources for two different firms from two different industries. We accept that the poor group process may have been caused by the distinct complexity of the two industries (Porter, 1980). Future research needs to assess the abovementioned variables.

CONCLUSION

This study, employing a dynamic behavioral RBV perspective (Kunc & Morecroft, 2010) shows that the group processes adopted during resource conceptualization can lead to diverse levels of insights into the relationship between strategic resources and firm performance. Based on this finding, we present a number of distinct contributions to the RBV paradigm.

We believe this paper advances the dynamic RBV paradigm by introducing the concept of group decision process. Bringing this idea into the RBV helps to illustrate how managerial processes can affect the configuration of the set of resources considered to be strategically relevant to a strategy (Maritan & Peteraf, 2011).

This study also conforms to the traditional RBV and its VRIN/O framework. The ultimate aim of the managers working within the RBV paradigm is to build a set of resources that has

VRIN/O characteristics (Barney, 1991; 1995). However, this is not a simple process; it can be confounded by the group dynamics observable during the top management team discussions, as this paper has illustrated.

In our study, the group that focused on causal linkages presented a clearly conceptualized and causally linked set of resources compared to the group that focused on resource generation. We found that increasing the understanding of the linkages between resources and firm performance may reduce the potential causal ambiguity (King, 2007). For that reason, firms which develop a clear understanding of linkages between resources during their resource conceptualization process are likely to be less susceptible to causal ambiguity. In turn, this leads to the improvement of organizational learning and resource management actions (Kunc & Morecroft, 2010).

For the discrete resources oriented group, it is worth mentioning that they produced more resources and concepts than the systemic resources oriented group. For this reason, we conjecture that if a discrete resources oriented group can successfully develop causal relationships while maintaining a rich collection of concepts, they would be able to build a strategically relevant set of resources that satisfy VRIN/O characteristics.

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TABLE 1

Result of quantitative analysis

Construct	Cronbach's α	Average score	
		Group A	Group B
Mental model complexity		23	17
Satisfaction		5.71	3.9
Level of deliberateness	0.8713	4.6	2.4
Overload	0.9509	2.67	6.13
Cognitive conflict	0.8289	5.8	5
Affective conflict	0.9356	2.4	4.73

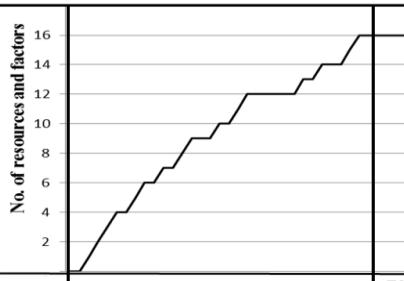
TABLE 2

Comparisons of two groups

Group dynamics variables	**Systemic resources oriented group (Group A)**	**Discrete resources oriented group (Group B)**
Deliberateness of the resource conceptualization	Deliberate and well-structured resource conceptualization	Started with a comprehensive resource/factor identification; but in overall, experienced anarchic and messy resource conceptualization process
Cognitive overload	Complex task of resource conceptualization is well managed with an orderly and well-structured conceptualization process.	Complex task of resource conceptualization was not managed. Instead, an anarchic group process caused high level of information demand and processing, which led to cognitive overload.
Cognitive conflicts	Efficient and effective interactions between heterogeneous mental models regarding the resource system due to clear form of cognitive conflicts.	Inefficient and ineffective interactions between heterogeneous mental models regarding the resource system due to unclear form of cognitive conflicts.
Affective conflicts	The group was able to focus without high level of tension/affective conflicts.	The resource conceptualization process was hindered by high level of tension / affective conflicts.

FIGURE 1

Changes in Group A's number of resources/factors in a chronological order



Phase	Phase 1	Phase 2	Phase 3	Phase 4
Activity	Resource and factor generation by linkages	Clarifying generated concepts and adding extra linkages	Aligning the resource map with the firm's vision	Final check of the resource map
Resources and factors at the end of the phase	**Plane** Capacity **Route** **Staff** **Cash** Passengers Revenue Ability to invest Cost Marketing Input cost Price Value proposition Competitive value proposition Airline product State of economy	**Plane** Capacity **Route** **Staff** **Cash** Passengers Revenue Ability to invest Cost Marketing Input cost Price Value proposition Competitive value proposition Airline product State of economy	**Plane** Capacity **Route** **Staff** **Cash** Passengers Revenue Ability to invest Cost Marketing Input cost Price Value proposition Competitive value proposition Airline product State of economy	**Plane** Capacity **Route** **Staff** **Cash** Passengers Revenue Ability to invest Cost Marketing Input cost Price Value proposition Competitive value proposition Airline product State of economy

FIGURE 2

Resource map of Group A

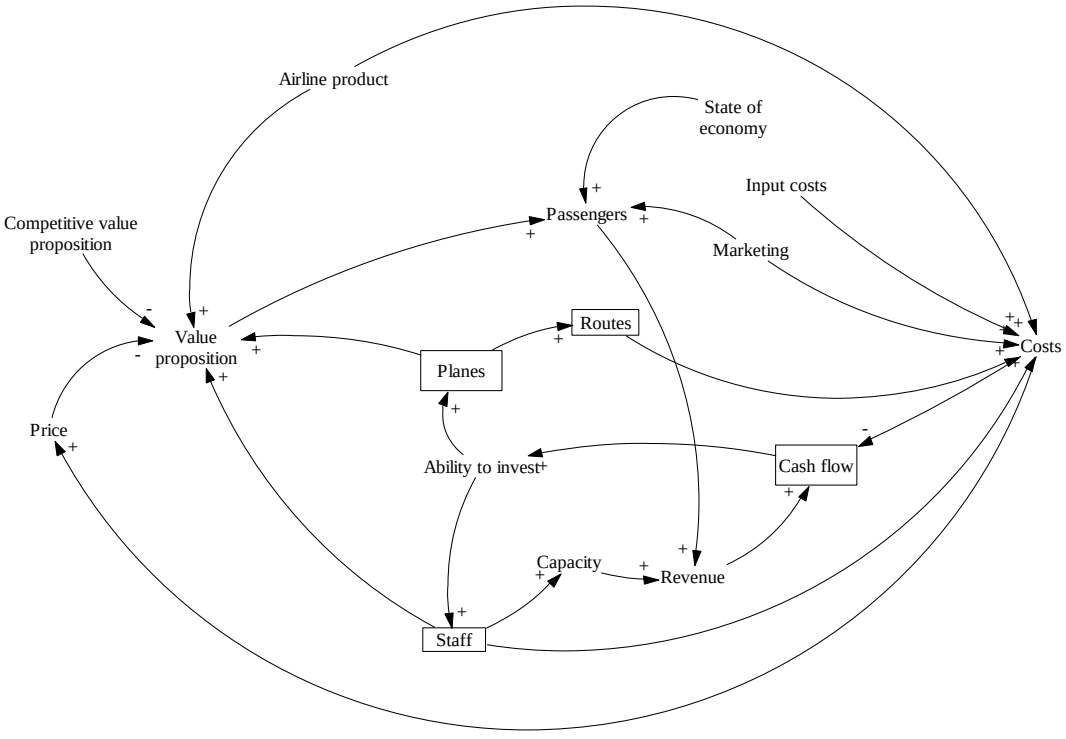
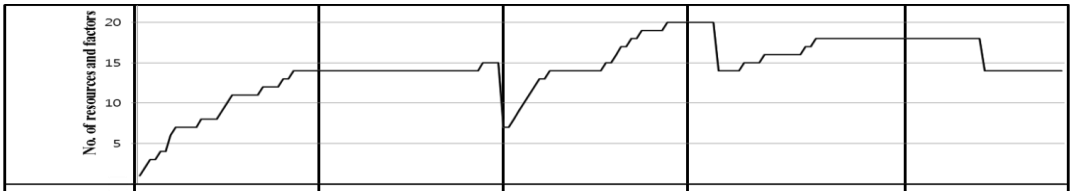


FIGURE 3

Changes in Group B's number of resources/factors in a chronological order



Phase	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5
Activity	Resource and factor generation	Creating linkages between resources	Developing the resource map under big themes	Linking four themes and creating a generic map	Finalizing the map
Resources and factors at the end of the phase	**Cash (flow)** **Customer** Product Service **Manufacturing capacity** **Distribution channel** **Brand** Marketing (budget) Advertising Process **Staff** Sales Expense Innovation	**Cash (flow)** Product Service **Distribution channel** Marketing (budget) **Staff** Sales	**Cash (flow)** Product Service **Distribution channel** Marketing (budget) **Staff** Sales **Engineer** **Call centre** Technology Supply chain management **Sales and marketing staffs** Wage **Reputation** Demand **Research facility** R&D Training Service standard Service quality Customer satisfaction	**Cash (flow)** Product Service **Distribution channel** Marketing (budget) **Staff** Sales **Reputation** Demand Service standard Service quality Channel management Supply chain management **Research facility** R&D Training Technology Investment Customer satisfaction	**Cash (flow)** Production Product service offers New Product **Distribution Channel** Marketing (budget) **Staff** Sales **Reputation** Demand Service standard Service quality Investment Customer satisfaction

FIGURE 4

Resource map of Group B